

Honey Gold Pineapple

PLANT PATENT APPLICATION

Title: Pineapple plant named “Honey Gold”

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BACKGROUND OF THE INVENTION

10 The present invention comprises a new and distinct pineapple variety of *Ananas comosus*, hereinafter referred to by the variety name “Honey Gold”. The variety has been developed by using clonal selection. The process started at the end of 1997 using material from the hybrid Tainung 11 (also known as Perfume pineapple in Taiwan). The process took five years of consecutive plantings and selections.

15 The plant is under cultivation in the research area of Corporacion de Desarrollo Agricola Del Monte, S.A. (PINDECO), since it was brought to Costa Rica at the end of 1997. The original seedlings were asexually reproduced using stem cuttings and crowns.

20 The main objective of the selection program, was to obtain a pineapple variety with a nice tasting fruit, that would keep the original aroma, with fruit of an appropriate size and shape, but distinguished for having a higher concentration of ascorbic and citric acid, brix or soluble solids, an fewer plant slips, with respect to the parental line.

25 Personnel of PINDECO’s Research Department in Buenos Aires-Puntarenas, Costa Rica, have developed this new plant. From a group of 19 crowns (asexual seeds) obtained through Del Monte Fresh Produce personnel in Hong Kong, the process of sowing began by selecting the plants with better characteristics through three generations.

30 The clone selected after all this effort, resembles the original parental material, but it is distinguished by its higher sugar (TSS), citric acid, ascorbic acid levels, and also by the fewer slips per plant.

SUMMARY OF THE INVENTION

The invention relates to a new and distinct variety of the Bromeliaceae, or pineapple family, which was derived by clonal selection from the hybrid Tainung 11, or Perfume
5 pineapple, after continued five year selection and reproduction effort.

The plant is characterized by smooth leaves, with occasional presence of spines on the leaf tips; by the reduced number of slips and the higher citric acid and ascorbic acid levels, and the higher soluble solids content of the fruit flesh, when compared with the
10 parental line. The fruit is cylindrical to conic in shape, or medium size, and very resistant to skin dehydration damage. Mature fruit has an intense yellow color and a strong and sweet aroma, and a wonderful taste, characteristic of the parental line. It is susceptible to chill damage (or internal browning). Even in the absence of refrigeration, the shelf life of the fruit is very long, when compared with other varieties. This new variety produces
15 moderate yields of fruit, best suited for the fresh market.

BRIEF DESCRIPTION OF THE DRAWINGS

- Fig. 1. Shows the lateral view of a plant and root system against a metric ruler
20 Fig. 2. Shows a "Honey Gold" plantation
Fig. 3. Shows an overhead view of a "Honey Gold" plant.
Fig. 4. Shows a close-up of an immature fruit.
Fig. 5. Shows a mature plant, with three or less slips.

25 BOTANICAL DESCRIPTION OF THE PLANT

The following detailed description of the new variety is based on observations of well fertilized specimens which were grown under field conditions, in the Buenos Aires region, Costa Rica, at 350msnm, where temperatures generally range from 14°C to 37°C,
30 and annual rainfall averages 3251 mm.

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The plants were grown at PINDECO, the Del Monte Fresh Produce research facility in Buenos Aires, Costa Rica.

Color terminology and color designations reported herein are in accordance with Munsell

- 5 Color Notations for plant tissues published by Munsell Color Macbeth, a division of Kollmorgen Corporation, Baltimore, Maryland, USA.

The following description was taken at harvest beginning of 2003, of the general population of this new variety, which was sowed from asexual seed.

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Plant Identification

Name: Ananas comosus

- 15 *Parentage: Tainung 11 (Perfume pineapple).*

Origin: Clonal selection, through 5 years of consecutive selections and reproductions (three generations).

- 20 **Classification:**

I. *Botanic:* Bromeliaceae or pineapple family. Subfamily: Bromelioideae. Genus: Ananas. Subgenus: comosus. Variety: 'Honey Gold'.

- 25 II. *Commercial:* Bromeliad fruit plant.

Form: Terrestrial (in cultivation), with overlapping sessile leaves from a funnel-formed rosette, surrounding a composite inflorescence (during anthesis) and with 0 to 3 slips in the fruit peduncle that initiate before anthesis, and dominant suckers that are produced in
30 *the stem and originate subsequent crops.*

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General Description. 'Honey Gold' (Before anthesis)

Stem

- 5 I. *General*. Short, upright and sheathed by overlapping leaves, each leaf with a dormant axillary bud.
- II. *Stem texture*. Glabrous and fleshy.
- III. *Stem size*.
- A) Length (above soil level): Usually between 8 and 15.5 cm at anthesis.
- 10 B) Diameter between 5 y 7.4 cm at soil level at anthesis.
- IV. *Stem shape*. Cylindrical and with a narrower diameter at the distal part.

Leaves:

- 15 I. *General*. Closely overlapping sessile leaves (formed in acropetal succession) forming a dense rosette, the outline of which in longitudinal section is roughly heart shaped. The number of leaves fluctuates between 28 and 57 with a 5/13 phyllotaxy.
- II. *Texture*.
- 20 A) Upper epidermal area: Glabrous, semi-rigid and channeled (or concave) except at the leaf tip.
- C) Lower epidermal area: Finely striated (longitudinally) and appears covered with white layer consisting of scale-like trichomes.
- III. *Leaf arrangement*. Alternate and in rosette shape.
- 25 IV. *Leaf margins*. Plane, with rarely found irregularly spaced small deltoid-cuspidate hooked spines usually located on the distal portions of leaves.
- V. *Leaf venation*. Parallel
- VI. *Leaf shape*. Leaves are not uniform in shape and vary with the position of the leaf on the stem. The basal or oldest leaves are lanceolate while the base is
- 30 considerably expanded. There is a noticeable narrowing in width between non-chlorophyllous (basal) and chlorophyllous (or main portion) of the leaves. The

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longest or most mature leaves are lanceolate in form but the base is without the arcuate expansions of the preceding leaves. The remaining leaves (or center leaves of the plant rosette) are lanceolate in form with no expansion of width into the base.

5 VII. *Leaf size (at anthesis)*

A) Length: Usually between 69 and 85 cm for those leaves originating from the medium part of the stem with a non-chlorophyllous base that usually is between 2.6 and 6.4 cm of length.

10 B) Width: Normally between 4.1 and 6.0 cm in the mid leaf area of the longest leaves. The expanded basal disk usually has a maximum width of 7.5 to 10 cm.

C) Thickness: In the longest leaves, usually vary between 1.6 to 2.4 mm at the center of the mid leaf area and decreased laterally between 0.8 and 1.5 mm at the margin, while becoming slightly thinner at the tip. The expanded basal disk at the mid stem area usually has a maximum thickness of 1.5 to 3.8 mm at the center of
15 the blade and tapering laterally toward margins up to 0.36 to 1.28 mm.

VIII. *Color.*

A) Upper epidermal surface: 1. General: Color is usually dominated by yellowish green, olive green, and reddish green. The color of the basal disk is
20 dominated by a white hue and light yellow. 2. Chlorophyllous basal disk area: Commonly light yellowish (5Y 8/1, 5Y 8/2). 3. Mid leaf area: Commonly olive green (7.5 GY 5/4, 5R 3/4). 4. Leaf tip area: Commonly olive gray (5.0GY 6/4) reddish purple (5.0RP 4/2).

B) Lower epidermal area: 1. General: Commonly olive green to grayish olive
25 green with pale white basal disk area. 2. Lower epidermal surface: Scurfy surface that obscures colors commonly light olive green to grayish olive green (7.5GY 8/2, 7.5GY 7/2).

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Inflorescence (at anthesis)

- 5 I. *General*: Flower composite from 80 to 144 fruit lets borne per inflorescence of a long peduncle of approximately 21.2 cm length at the apical meristem. Individual bisexual flowers that consists of three sepals, six stamens, three stigmas and three carpels. The inflorescence is self-incompatible producing edible fruit parthenocarpically.
- II. *Texture*. Glabrous and fleshy.
- 10 III. *Shape*. Oval with slightly raised flowers with a reddish green hue in the crown. Crown leaves are short and erect at anthesis.
- IV. *Size and color*. Comparable to specimens of *Ananas comosus* L. mer. Petals are light lilac.

15 Fruit (at harvest)

- I. *Size*. Usually has a weight between 433 and 1051 gms with average fruit of 837 gms.
- 20 II. *Shape*. Cylindrical or slightly conic with small and prominent fruit lets. Medium crown with thin and semi-rigid leaves.
- III. *How borne*. Fruit develop from the apical meristem of the plant on a long peduncle, usually between 19 and 24 cm length.
- IV. *Color*
- 25 A) Shell: Commonly dark green (7.5GY 4/4), olive green (5.0GY 7/6), reddish (5R 3/6) and/or yellow (10YR 7/8).
- B) Pulp: Usually light yellow (5.0Y 8/4 to 5.0Y 8/2).
- V. *Brix*. Typically between 14.40 and 18.10 degrees, with an average of 16.18.
- 30 VI. *Total acid levels*. Usually between 0.67 and 1.33 gms citric acid/100 ml of juice (average 0.98).

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VII. *Vitamin C content*. Regularly between 14.73 and 37.36 mg/100 ml of juice, with an average of 21.14.

Others

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I. *Fertility*. As any other grown up pineapple, this plant is self-incompatible reason why presence of sexual seeds is almost negative. The materials used for planting are slips and the non-commercial fruit crowns.

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II. *Vigor*. It is considered that the plant vigor is similar as to mother plants. It is a slow growing plant as compared to other types of pineapple like Champaka or the hybrid MD-2.

III. *Yield*. Each plant estimated yield is 61 tons/ha.

IV. *Market*. Fruit will be designated to the international fruit market.

V. *Plant use*. Fruit will be commercialized into the fresh fruit market.

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Summary of special characteristics of 'Honey Gold' selection

The 'Honey Gold' plant presents differences, compared to parental line, as follows:

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Plant with fewer slips: according to Chan (1995) Tainung 11 plants usually bear 7 slips while 'Honey Gold' plants bear 0-3 slips. Fewer slips reduce contact with the fruit, hence reducing problems caused by leaves rubbing against the fruit, accumulation of organic matter, and the concomitant staining of the fruit base. It also decreases problems of color inconsistency in the fruit that can be caused by the shade from a high number of slips.

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The fruit presents higher levels of brix, citric and ascorbic acid than mother plants. As a result of the clonal selection process, the 'Honey Gold' pineapple contains 112% more citric acid and 14/3% higher Brix than Tainung 11. Ascorbic acid levels have been increased 28.2% over the levels observed in the original population. (Note: we are in the process of obtaining ascorbic acid specifications for Tainung 11. When these levels are

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known, it will then be possible to calculate a percent increase in ascorbic acid for 'Honey Gold' vs. Tainung 11. These characteristics of the 'Honey Gold' plant have been stable and it is anticipated that they will be consistently expressed in future generations.

5 Individual plant Description

The following is a general description of a new pineapple plant variety that was grown by vegetative propagation (cloning selection) in a nursery of Corporación de Desarrollo

10 Agrícola Del Monte S.A. (PINDECO) in Buenos Aires, Puntarenas, Costa Rica.

Plant Age: 10 months after initial propagation and 3 months after forcing.

Plant Diameter: About 77cm between opposite leaf tips.

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Plant Height: 79 cm above ground surface.

Stem:

20 I) Length: 12 cm

II) Diameter: 7.0 cm at base.

Leaves:

25 I) *Number:* 42

II) *Length:* 75 cm at longest leaves.

III) *Width* (largest leaves): At mid leaf (max) 5.2 cm; at basal disk area (max) 8.7 cm

IV) *Thickness:* 1.8 mm along the axis.

V) *Color:*

30 A) Upper epidermal area - Chlorophyllous area: Commonly olive green (5.0GY 6/4 and 5.GY 5/4) and reddish brown (5R 8/3).

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B) Upper epidermal area - Non-Chlorophyllous area: Commonly pale white (5Y 8/1).

C) Lower epidermal area: Commonly from olive green to grayish olive green (7.5GY 8/2 and 7.5GY 7/2).

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Inflorescence:

General: Composite flower with an inflorescence borne from a long peduncle of approximately 13 cm length at the apical meristem. The flower is composed of 136 fruitlets. Petals are white (10YR 8/1) in the proximal part, and pale lilac (5RP6/4) in the distal part.

15 **Literature**

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Chang, C.C., Chen-Yung, W. 1997. Pineapple breeding. In: Chang-LinRen (eds.)

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